



Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A link mechanism comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the first wide section of the first link includes a short subsection extending circumferentially from a link center line of the first link in a first rotational direction, and a long subsection extending from the link center line of the first link in a second rotational

direction opposite to the first rotational direction, and having a circumferential length greater than a circumferential length of the short subsection.

2. (Original) The link mechanism as claimed in Claim 1, wherein the first wide section confronts the second narrow section in the axial direction, and the second wide section confronts the first narrow section in the axial direction.

3. (Currently Amended) The link mechanism as claimed in Claim 1, wherein the second link includes first and second side walls each formed with the cylindrical second pin boss portion and second narrow and wide sections of the second pin boss portion, the first wide section of the first pin boss portion is placed in the axial direction between the second narrow sections of the first and second side walls, and the first narrow section is placed in the axial direction between the second wide sections of the first and second side walls.

4. (Currently Amended) The link mechanism as claimed in Claim 1, wherein the link mechanism further comprises ~~a third link linked with one of the first and second links, to form a linkage of the first, second and third links, connected between a piston of an internal combustion engine, and an actuating section to vary a compression ratio of the engine; and wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft of the engine.~~

5. (Original) The link mechanism as claimed in Claim 4, wherein the first and second links are so arranged that a combustion load due to a combustion pressure acting on the piston is applied to the connecting pin from the first and second wide sections.

6. (Cancelled)

7. (Currently Amended) The link mechanism as claimed in Claim ~~[[6]]~~ 1, wherein the short subsection of the first link extends circumferentially toward a swing axis about which the second link is swingable, and the long subsection of the first link extends circumferentially away from the swing axis of the second link; and the first link extends from a first end defining a link connecting point, to a second end formed with the first pin boss portion

defining another [[a]] link connecting point, and the link center line of the first link is a line connecting the link connecting points of the first and second ends of the first link.

8. (Currently Amended) The link mechanism as claimed in Claim [[6]] 1, wherein the long subsection is formed with an oil hole passing radially through the long subsection.

9. (Currently Amended) A [[The]] link mechanism ~~as claimed in Claim 4~~, comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the link mechanism is a variable engine compression ratio mechanism so arranged that a piston speed near a top dead center of the piston is slower than a piston speed near a bottom dead center of the piston.

10. (Currently Amended) A [[The]] link mechanism as claimed in Claim 4, comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the second link is the lower link rotatably mounted on the crank pin, the first link is an upper link connecting the lower link and the piston of the engine; the lower link includes a bifurcated end portion including first and second side arms each of which is

formed with the second pin boss portion; and the first pin boss portion is placed between the second pin boss portions of the first and second side arms of the lower link.

11. (Currently Amended) A [[The]] link mechanism as ~~claimed in Claim 4~~, comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the first link is the lower link rotatably mounted on the crank pin, the second link is an upper link connecting the lower link and the piston of the engine; the upper link includes a bifurcated end portion including first and second side arms each of which is

formed with the second pin boss portion; and the first pin boss portion is placed between the second pin boss portions of the first and second side arms of the upper link.

12. (Currently Amended) A [[The]] link mechanism as ~~claimed in Claim 4~~, comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the first link is the lower link rotatably mounted on the crank pin, the second link is a control link connecting the lower link to an [[the]] actuating section; the control link includes a bifurcated end portion including first and second side arms each of which is

formed with the second pin boss portion; and the first pin boss portion is placed between the second pin boss portions of the first and second side arms of the control link.

13. (Cancelled)

14. (Currently Amended) A [[The]] link mechanism as claimed in Claim 13, comprising:

a first link including a cylindrical first pin boss portion;

a second link including a cylindrical second pin boss portion; and

a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;

wherein the link mechanism further comprises a third link linked with one of the first and second links, to form a linkage of the first, second and third links connected with a piston of an internal combustion engine;

wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft for the engine;

wherein the lower link includes a main bearing portion formed with a hole for receiving the crank pin, and first and second swing arms which project from the main bearing portion in different directions and which are connected, respectively, with the other links;

wherein the main bearing portion, and the first and second swing arms of the lower link are integral parts of the lower link.

15. (Currently Amended) A piston crank mechanism for varying a compression ratio of an internal combustion engine, comprising:

- a lower link mounted rotatably on a crank pin of the engine;

- an upper link connecting the lower link with a piston of the engine;

- a control link including a first end connected with the lower link; and

- a support point adjusting mechanism connected with a second end of the control link

and arranged to shift a support point of the second end of the control link to vary a compression ratio of the engine;

one of the lower link, the upper link and the control link being a first link, a second link being another of the lower link, the upper link and the control link, the first link including a cylindrical first pin boss portion;

the second link including a cylindrical second pin boss portion connected with the first pin boss portion by a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links;

the first pin boss portion including a first narrow section extending in a circumferential direction of the first pin boss portion, and having an axial wall thickness as measured in an axial direction of the connecting pin;

the first pin boss portion further including a first wide section extending in the circumferential direction of the first pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the first narrow section;

the second pin boss portion including a second narrow section extending in a circumferential direction of the second pin boss portion, and having an axial wall thickness as measured in the axial direction;

the second pin boss portion including a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section;

the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction;



wherein the first wide section of the first link includes a short subsection extending circumferentially from a link center line of the first link in a first rotational direction, and a long subsection extending from the link center line of the first link in a second rotational direction opposite to the first rotational direction, and having a circumferential length greater than a circumferential length of the short subsection.